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18/MHS06/044**

**MLS**

**BCH 202 Assignment 2**

**question**

1. Which of the following is not a function of triacylglycerol.
2. Energy storage b. insulation c. shock absorption d. membrane structure
3. Fatty acids are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ acids.
4. The sterol nucleus of steroid is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ring.
5. Chylomicrons transport \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. Write concisely on the functional characteristics of Nucleus, Mitochondria and Endoplasmic reticulum.
7. Explain the various classes of glycolipids and draw the structure of one.

ANSWERS

1. Membrane structure is not a function of triacylglycerol.

2. Fatty acids are carboxylic acids.

3. Chylomicrons transport lipids and from the intestine to the adipose tissue to the cardiac and the skeletal muscular tissue.

4. **Functions of Nucleus**

1. It controls the heredity characteristics of an organism.
2. It main cellular metabolism through controlling synthesis of particular enzymes.
3. It is responsible for protein synthesis, cell division, growth and differentiation.
4. Stores heredity material in the form of deoxy-ribonucleic acid (DNA) strands. Also stores proteins and ribonucleic acid (RNA) in the nucleolus.
5. It is a site for transcription process in which messenger RNA (mRNA) are produced for protein synthesis.
6. It helps in exchange of DNA and RNA (heredity materials) between the nucleus and the rest of the cell.
7. Nucleolus produces ribosomes and are known as protein factories.
8. It also regulates the integrity of genes and gene expression.

**Functions of mitochondria:**

The mitochondrion is the site of ATP synthesis for the cell. The number of mitochondria found in a cell are therefore a good indicator of the cell’s rate of metabolic activity; cells which are very metabolically active, such as hepatocytes, will have many mitochondria.

Mitochondria also have a role to help maintain the intracellular environment. They:

* Store caspases responsible for triggering apoptosis
* Are able to transiently store calcium contributing to calcium homeostasis

In brown adipose tissue mitochondria have an alternative function of heat production using the electron transport chain.

**Function of Endoplasmic reticulum:**

The ER plays a number of roles within the cell, from protein synthesis and lipid metabolism to detoxification of the cell. Cisternae, each of the small folds of the endoplasmic reticulum, are commonly associated with lipid metabolism. This creates the plasma membrane of the cell, as well as additional endoplasmic reticulum and organelles. They also appear to be important in maintaining the Ca2+ balance within the cell and in the interaction of the ER with mitochondria.This interaction also influences the aerobic status of the cell.

ER sheets appear to be crucial in the response of the organelle to stress, especially since cells alter their tubules-to-sheets ratio when the number of unfolded proteins increases. Occasionally,apoptosis is induced by the ER in response to an excess of unfolded protein within the cell. When ribosomes detach from ER sheets, these structures can disperse and form tubular cisternae.

5. **Glyceroglycolipids:** a sub-group of glycolipids characterized by an acetylated or non-acetylated glycerol with at least one fatty acid as the lipid complex. Glyceroglycolipids are often associated with photosynthetic membranes and their functions. The subcategories of glyceroglycolipids depend on the carbohydrate attached.

**Galactolipids:** defined by a galactose sugar attached to a glycerol lipid molecule. They are found in chloroplast membranes and are associated with photosynthetic properties.

**Sulfolipids**: have a sulfur-containing functional group in the sugar moiety attached to a lipid. An important group is the sulfoquinovosyl diacylglycerols which are associated with the sulfur cycle in plants.

**glycosphingolipids**: a sub-group of glycolipids based on sphingolipids. Glycosphingolipids are mostly located in nervous tissue and are responsible for cell signaling.

**Cerebrosides**: a group glycosphingolipids involved in nerve cell membranes.

**Galactocerebrosides**: a type of cerebroside with galactose as the saccharide moiety

**Glucocerebrosides:** a type of cerebroside with glucose as the saccharide moiety; often found in non-neural tissue.

**Sulfatides**: a class of glycolipids containing a sulfate group in the carbohydrate with a ceramide lipid backbone. They are involved in numerous biological functions ranging from immune response to nervous system signaling.

**Gangliosides**: the most complex animal glycolipids. They contain negatively charged oligosaccharides with one or more sialic acid residues; more than 200different gangliosides have been identified. They are most abundant in nerve cells.

**Globosides**: glycosphingolipids with more than one sugar as part of the carbohydrate complex. They have a variety of functions; failure to degrade these molecules leads to Fabry disease.

Glycophosphosphingolipids: complex glycophospholipids from fungi, yeasts, and plants, where they were originally called "phyto glycolipids". They may be as complicated a set of compounds as the negatively charged gangliosides in animals.

**Glycophosphatidylinositol:** a sub-group of glycolipids defined by a phosphatidylinositol lipid moiety bound to a carbohydrate complex. They can be bound to the C-terminus of a protein and have various functions associated with the different proteins they can be bound to.